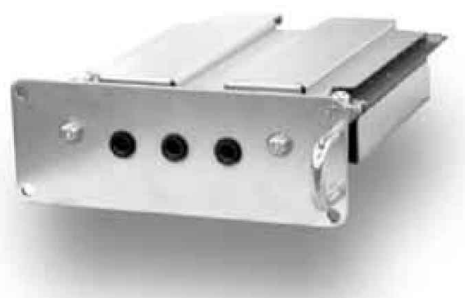


Service Manual

Ir Through Terminal Board

TY-FB9RT



WARNING

This service information is designed for experienced service personnel only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential danger in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced service personnel. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

CONTENTS

	Page		Page
1 Safety Precautions	2	7.1. Schematic Diagram Notes	9
1.1. General Guidelines	2	7.2. HR-Board Block Diagram	11
2 Prevention of Electro Static Discharge (ESD) to		7.3. HR-Board Schematic Diagram	12
Electrostatically Sensitive (ES) Devices	3	8 Replacement Parts List	13
3 About lead free solder (PbF)	4	8.1. Replacement Parts List Notes	13
4 Replacement	5	8.2. Electrical Replacement Parts List	14
5 Connection	6	8.3. Mechanical Replacement Parts List	15
6 Circuit Board Layout	7	8.4. Parts Location (1)	16
6.1. HR-Board	7	8.5. Parts Location (2)	17
7 Block and Schematic Diagram	9		

1 Safety Precautions

1.1. General Guidelines

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.1.1. Leakage Current Cold Check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between $1M\Omega$ and $5.2M\Omega$.

When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

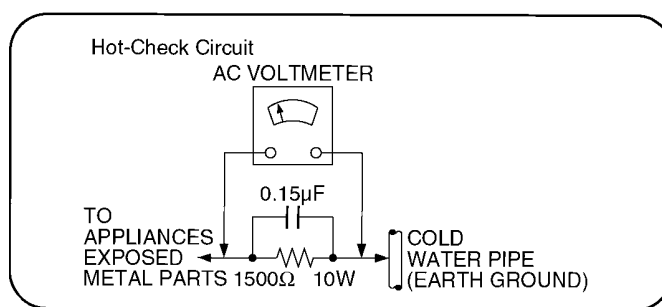


Figure 1

1.1.2. Leakage Current Hot Check (See Figure 1.)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a $1.5k\Omega$, 10 watts resistor, in parallel with a $0.15\mu F$ capacitors, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

2 Prevention of Electro Static Discharge (ESD) to Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electro static discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static (ESD protected)" can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

Caution

Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by  in the schematic diagrams, Exploded Views and replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

3 About lead free solder (PbF)

Note: Lead is listed as (Pb) in the periodic table of elements.

In the information below, Pb will refer to Lead solder, and PbF will refer to Lead Free Solder.

The Lead Free Solder used in our manufacturing process and discussed below is (Sn+Ag+Cu).

That is Tin (Sn), Silver (Ag) and Copper (Cu) although other types are available.

This model uses Pb Free solder in it's manufacture due to environmental conservation issues. For service and repair work, we'd suggest the use of Pb free solder as well, although Pb solder may be used.

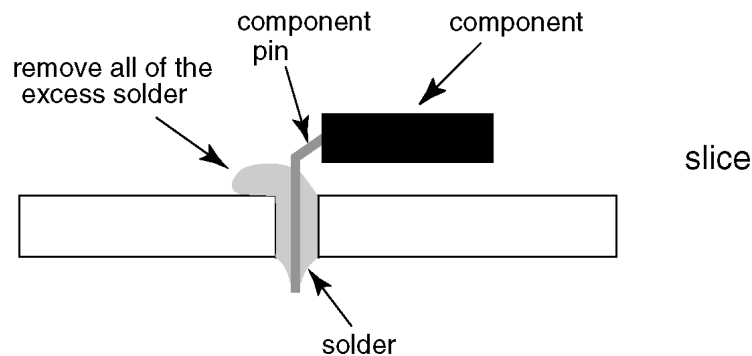
PCBs manufactured using lead free solder will have the PbF within a leaf Symbol PbF stamped on the back of PCB.

Caution

- Pb free solder has a higher melting point than standard solder. Typically the melting point is 50 ~ 70 °F (30~40°C) higher. Please use a high temperature soldering iron and set it to 700 ± 20 °F (370 ± 10 °C).
- Pb free solder will tend to splash when heated too high (about 1100 °F or 600 °C).

If you must use Pb solder, please completely remove all of the Pb free solder on the pins or solder area before applying Pb solder. If this is not practical, be sure to heat the Pb free solder until it melts, before applying Pb solder.

- After applying PbF solder to double layered boards, please check the component side for excess solder which may flow onto the opposite side. (see figure below)



Suggested Pb free solder

There are several kinds of Pb free solder available for purchase. This product uses Sn+Ag+Cu (tin, silver, copper) solder. However, Sn+Cu (tin, copper), Sn+Zn+Bi (tin, zinc, bismuth) solder can also be used.

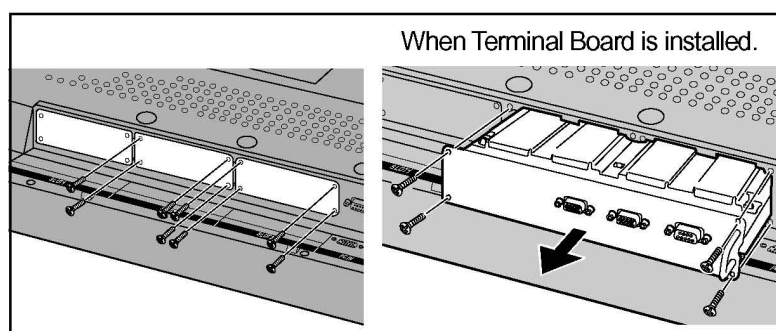
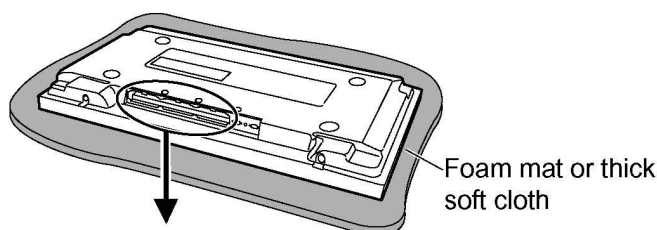
0.3mm X 100g	0.6mm X 100g	1.0mm X 100g

4 Replacement

The following explanation uses the 42/50-inch plasma display as an example. The terminal board shown is a typical example of one that can be replaced.

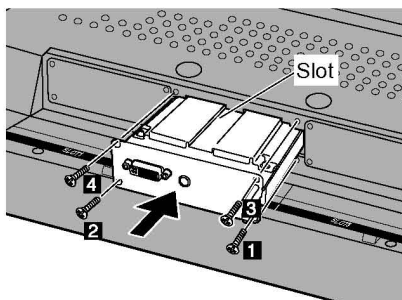
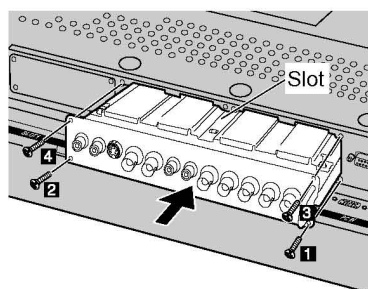
- Before proceeding with the replacement steps, be sure to turn off the entire system including the display, unplug all components from their outlets, and disconnect all the interconnect cables from the display.

The following example shows installation of a dual slot size board and a single slot size board.



1. Removing the dummy cover or mounted terminal board from display:

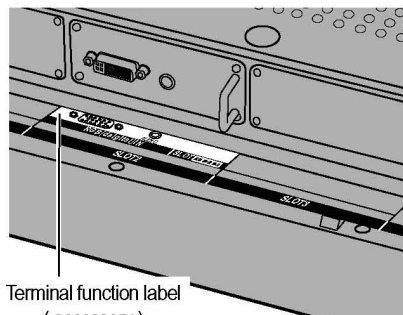
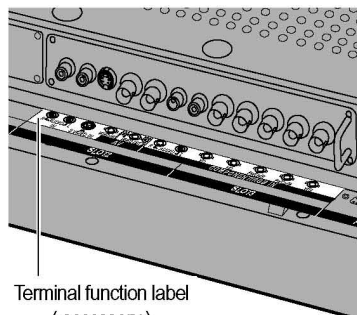
- Remove the slot cover securing screws (4 or 8 screws) on the back of the display. If a terminal board is already installed, grip the handle of the terminal board, and slowly pull out in the direction of the arrow.



2. Installing desired Terminal Board:

1. Insert the desired Terminal Board into the slot until it is firmly plugged into the card connector.
 - Make sure that the Board does not ride on the two lower claws.
2. Secure using the previously removed screws or those supplied with the unit. Tighten screws in the numbered order **1 - 4**.

Please note that there are slot fastening screws at 4 points on each slot (at 2 locations on both the left and right edges), so the number of fastening screws will vary depending on the number of slot insertions. Be sure to fasten all screws tightly.



3. Applying the terminal function label:

Peel off the backing sheet from the terminal function label (accessory) and affix it over the existing label.

- Make sure that the label is affixed with the correct position.

Have the customer keep the removed Terminal Board for future servicing needs.

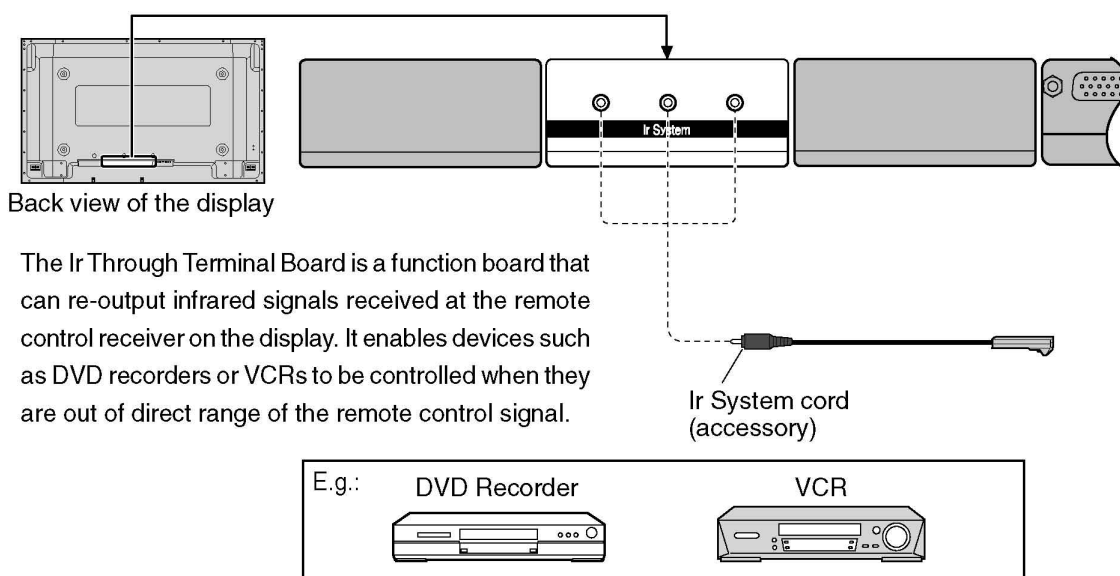
5 Connection

Slot Nos. of the display unit that are compatible with terminal board attachments.

2 slots model	Slot1, Slot2
3 slots model	Slot1, Slot2, Slot3

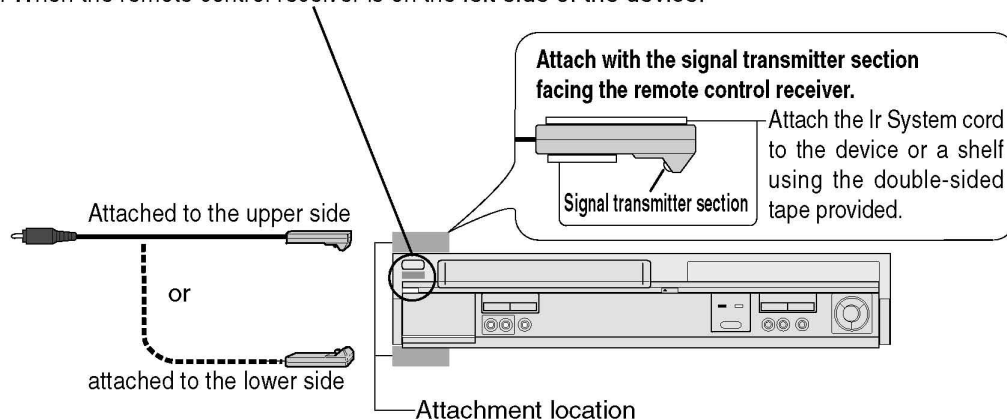
Note: Only one Terminal Board can be installed on a display.

Connection



Attach the Ir System cord in line with the position of the remote control receiver of your DVD recorder (or VCR, etc).

E.g.: When the remote control receiver is on the left side of the device.

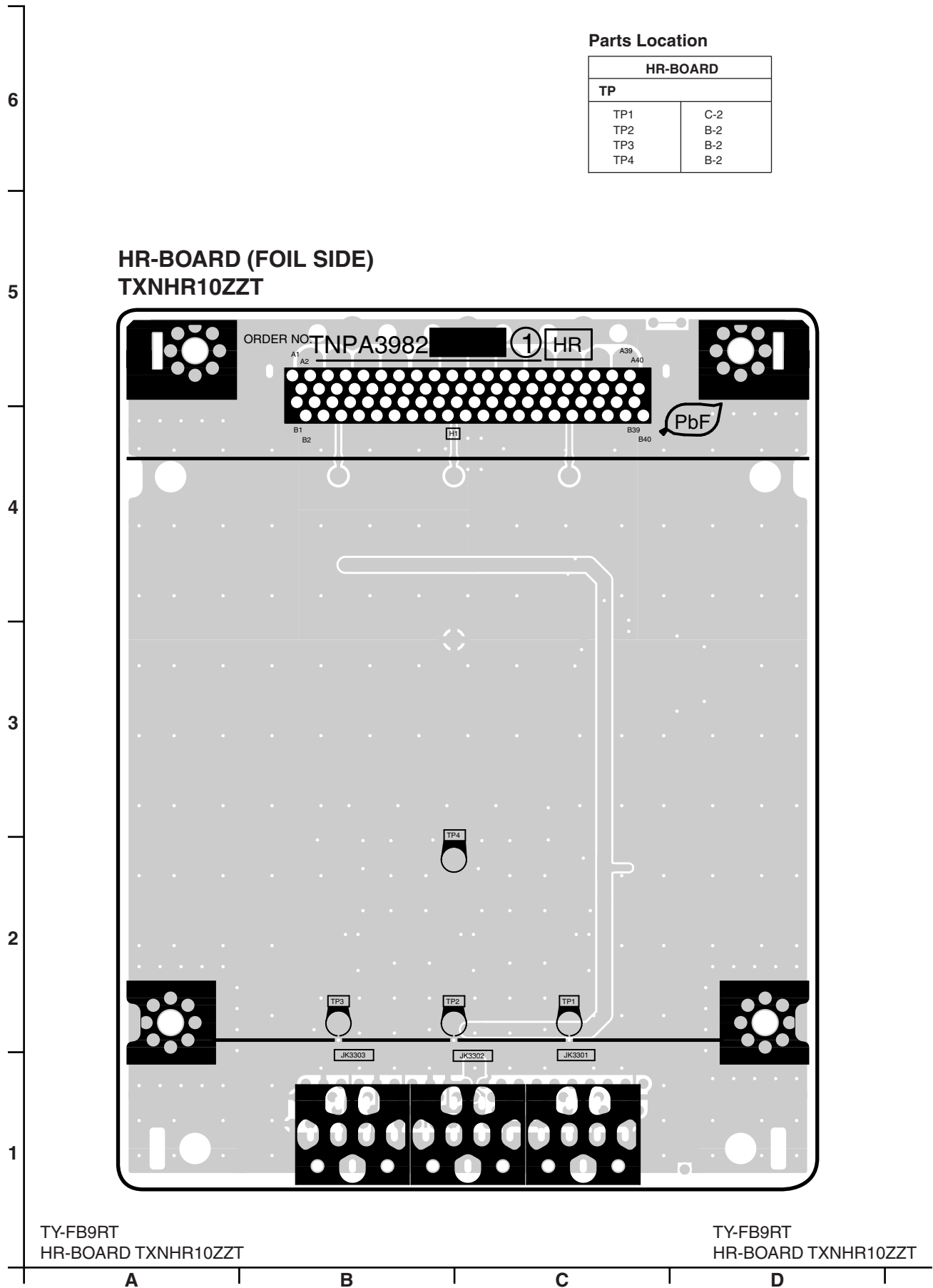


Notes:

- This Terminal Board is intended for use with Panasonic devices.
- This Terminal Board can be used when the display is in either standby mode or normal mode.
- The signals output from the 3 terminals are identical.
- The carrier frequency of the remote control signal is 36.7kHz.
- Only one Terminal Board can be installed on a display.
- Secure the Ir System code with the xing band supplied with the display.
- Make sure that the Ir System cord attachment locations are completely free of dust and dirt before attaching the cord.
- Be careful when removing the Ir System cord from its attached location, as the double-sided tape has very strong adhesion that could damage the surface.

6 Circuit Board Layout

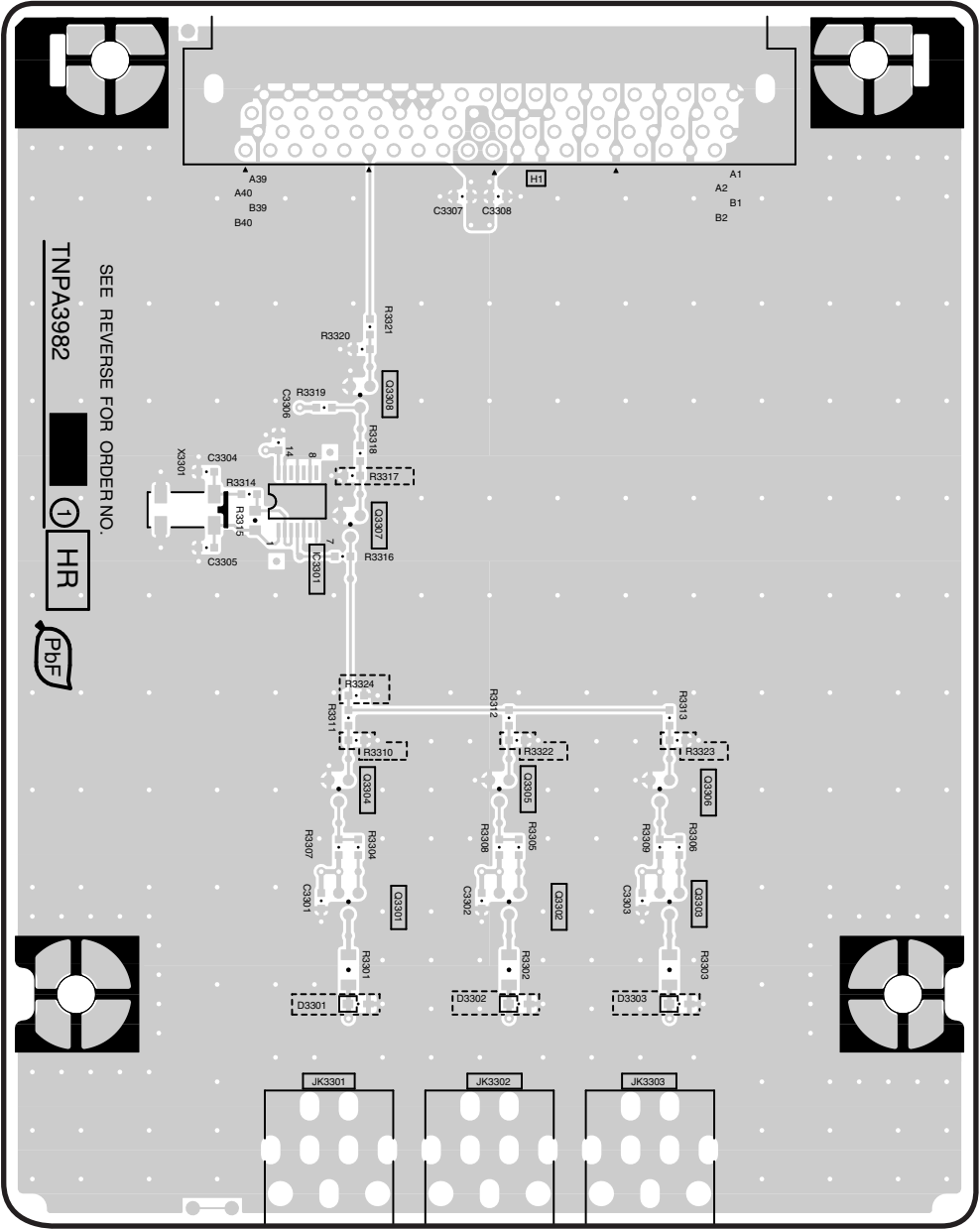
6.1. HR-Board



Parts Location

HR-BOARD	
IC	
IC3301	B-3
TRANSISTOR	
Q3301	B-2
Q3302	C-2
Q3303	C-2
Q3304	B-2
Q3305	C-2
Q3306	C-2
Q3307	B-3
Q3308	B-4

HR-BOARD (COMPONENT SIDE)
TXNHR10ZZT



TY-FB9RT
HR-BOARD TXNHR10ZZT

TY-FB9RT
HR-BOARD TXNHR10ZZT

7 Block and Schematic Diagram

7.1. Schematic Diagram Notes

Important Safety Notice

Components identified by $\triangle$ mark have special characteristics important for safety.
When replacing any of these components, use only manufacture's specified parts.

Notes:

1. **Resistor**
Unit of resistance is OHM [Ω] (K=1,000, M=1,000,000).
2. **Capacitor**
Unit of capacitance is μ F, unless otherwise noted.
3. Coil
Unit of inductance is μ H, unless otherwise noted.
4. Test Point
 : Test Point position
5. Earth Symbol
 : Chassis Earth (Cold)  : Line Earth (Hot)
6. Voltage Measurement
Voltage is measured by a DC voltmeter.
Conditions of the measurement are following:
Receiving Signal Colour Bar signal
All customer's controls Maximum positions
7. When arrow mark () is found, connection is easily found from the direction of arrow.
8. Indicates the major signal flow. : Video  Audio 
9. This schematic diagram is the latest at the time of printing and subject to change without notice.

Remarks:

1. The Power Circuit contains a circuit area which uses a separate power supplier to isolate the earth connection.

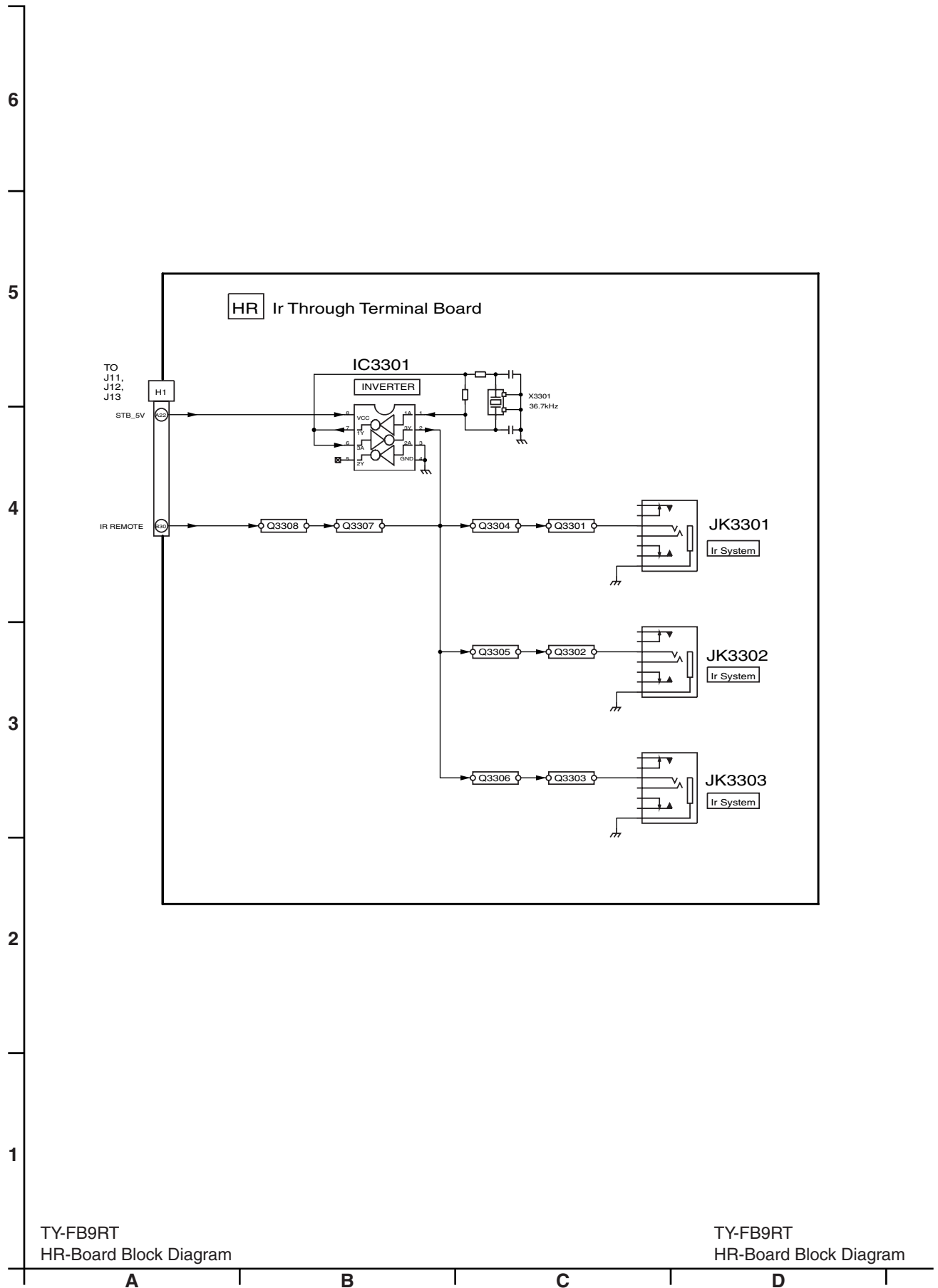
The circuit is defined by HOT and COLD indications in the schematic diagram. Take the following precautions.

All circuits, except the Power Circuit, are cold.

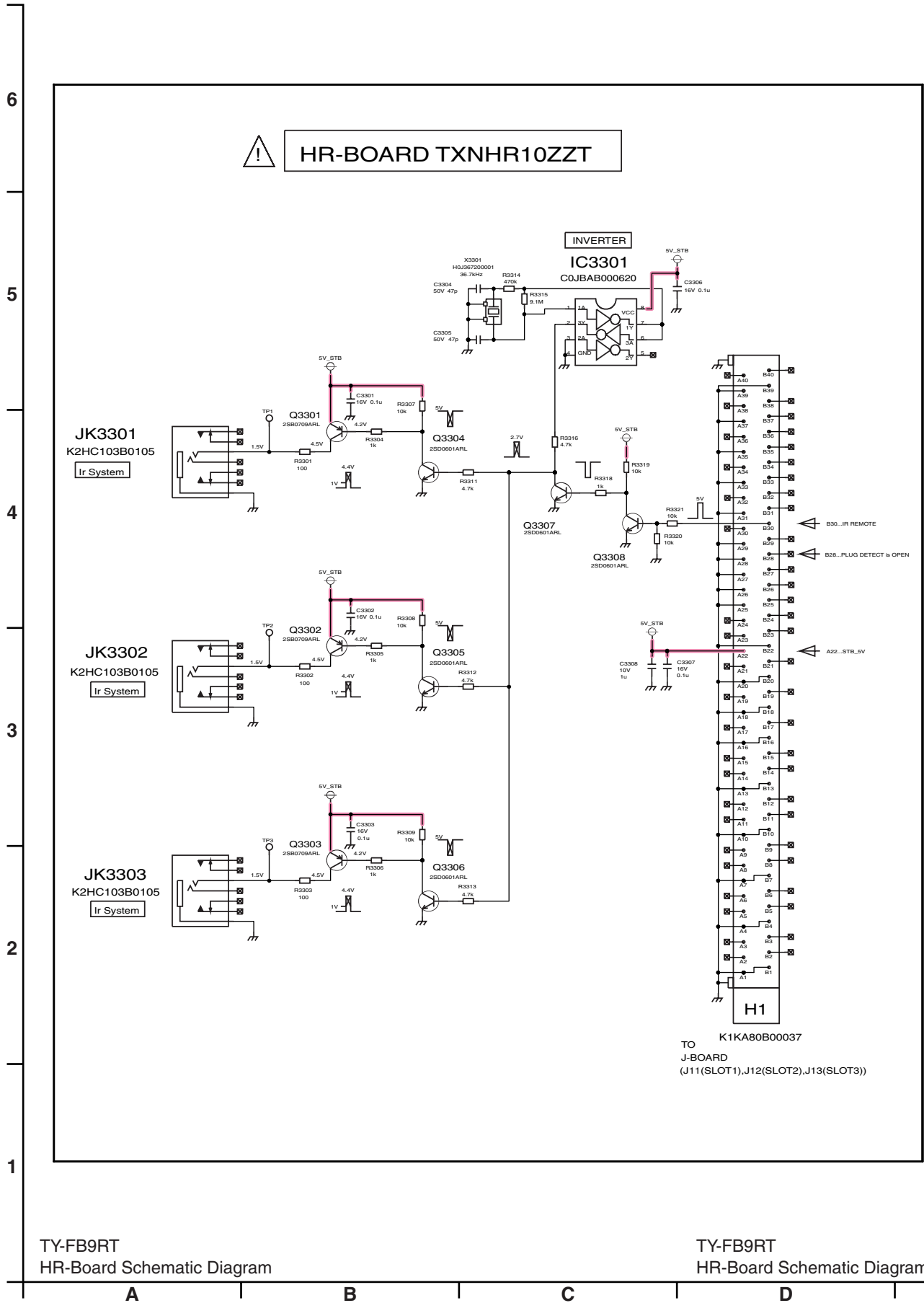
Precautions

- a. Do not touch the hot part or the hot and cold parts at the same time or you may be shocked.
- b. Do not short- circuit the hot and cold circuits or a fuse may blow and parts may break.
- c. Do not connect an instrument, such as an oscilloscope, to the hot and cold circuits simultaneously or a fuse may blow.
Connect the earth of instruments to the earth connection of the circuit being measured.
- d. Make sure to disconnect the power plug before removing the chassis.

7.2. HR-Board Block Diagram



7.3. HR-Board Schematic Diagram



8 Replacement Parts List

8.1. Replacement Parts List Notes

Important Safety Notice

*Components identified by $\triangle$ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.*

RTL (Retention Time Limited)

Note: The marking (RTL) indicates that the Retention Time is Limited for this item.

After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

Abbreviation of part name and description

1. Resistor

Example:

ERD25TJ104 C 100KOHM, J, 1/4W
 Type Allowance

2. Capacitor

Example:

ECKF1H103ZF C 0.01UF, Z, 50V
 Type Allowance

Type	Allowance
C : Carbon	F : $\pm 1\%$
F : Fuse	G : $\pm 2\%$
M : Metal Oxide	J : $\pm 5\%$
Metal Film	K : $\pm 10\%$
S : Solid	M : $\pm 20\%$
W : Wire Wound	

Type	Allowance
C : Ceramic	C : $\pm 0.25\text{pF}$
E : Electrolytic	D : $\pm 0.5\text{pF}$
P : Polyester	F : $\pm 1\text{pF}$
Polyprop	G : $\pm 3\text{pF}$
lene	J : $\pm 5\text{pF}$
T : Tantalum	K : $\pm 10\text{pF}$
	L : $\pm 15\text{pF}$
	M : $\pm 20\text{pF}$
	P : +100%, -0%
	Z : +80%, -20%

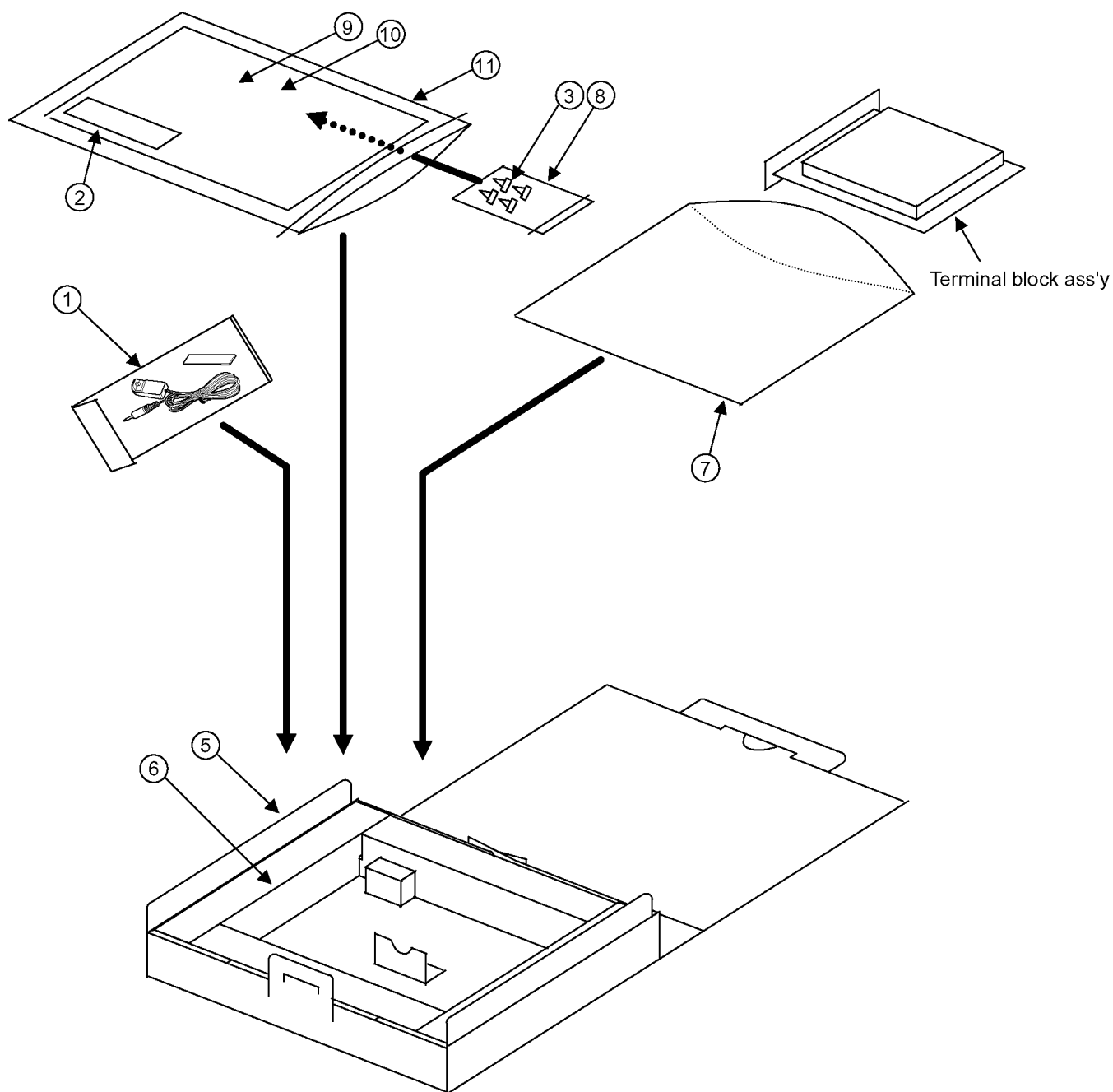
8.2. Electrical Replacement Parts List

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C3301-03	ECJ1XF1C104Z	C 0.1UF, Z, 16V	3	
C3304,05	ECJ1XC1H470J	C 47PF, J, 50V	2	
C3306,07	ECJ1XF1C104Z	C 0.1UF, Z, 16V	2	
C3308	ECJ1VB1A105K	C 0.01UF, Z, 50V	1	
H1	K1KA80B00037	80P CONNECTOR	1	
IC3301	C0JBAB000620	IC	1	
JK3301-03	K2HC103B0105	JACK	3	
Q3301-03	2SB0709A	TRANSISTOR	3	
Q3304-08	2SD601A	TRANSISTOR	5	
R3301-03	ERJ8GEYJ101	M 100 OHM, J, 1/8W	3	
R3304-06	ERJ3GEYJ102	M 1KOHM, J, 1/16W	3	
R3307-09	ERJ3GEYJ103	M 10KOHM, J, 1/16W	3	
R3311-13	ERJ3GEYJ472	M 4.7KOHM, J, 1/16W	3	
R3314	D0GB474JA007	M 470KOHM, J, 1/16W	1	
R3315	ERJ6GEYJ915	M 9.1MOHM, J, 1/10W	1	
R3316	ERJ3GEYJ472	M 4.7KOHM, J, 1/16W	1	
R3318	ERJ3GEYJ102	M 1KOHM, J, 1/16W	1	
R3319-21	ERJ3GEYJ103	M 10KOHM, J, 1/16W	3	
RTL	TXNHR10ZZT	TERMINAL BLOCK ASSY	1	△
X3301	H0J367200001	CRYSTAL	1	

8.3. Mechanical Replacement Parts List

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1	K2ZZ02C00006	IR SYSTEM CABLE	3	
2	TBMU687	TERMINAL SHEET	1	
3	THEL0239	SCREW FOR INSTALLATION	4	
4	THEL027N	SCREW	6	
5	TPCB13148	CARTON BOX	1	△
6	TPDF1103	CUSHION	1	
7	TPEH135	PROTECT COVER	1	
8	TQE6691	POLY BAG (SCREW)	1	
9	TQZH461-1	INSTRUCTION SHEET	1	
10	TQZH770	INSTRUCTION BOOK	1	△
11	XZBT6506	POLY BAG (INSTRUCTION BOOK)	1	

8.4. Parts Location (1)



8.5. Parts Location (2)

